



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,696	02/27/2004	Stephen M. Potter	3566	9300

22474 7590 08/04/2005

DOUGHERTY, CLEMENTS, HOFER, BERNARD & WALKER
1901 ROXBOROUGH ROAD
SUITE 300
CHARLOTTE, NC 28211

EXAMINER

MCNELIS, KATHLEEN A

ART UNIT PAPER NUMBER

1742

DATE MAILED: 08/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/789,696

Applicant(s)

Potter et al

Examiner

Kathleen A. McNelis

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/25/05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

12

Claims 1-7 remain for examination, wherein claims 1-4 and 6 are amended.

Claim 8 has been added.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1742

Claims 1-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Villarreal-Trevino, et al., US patent publication 6,395,056.

With respect to applicant's amended claims 1 and 2 and new claim 8: Villarreal-Trevino et al. teach a pretreatment process for solid lump feed material (col. 2, lines 66-67), as well as pellet, sinter other otherwise agglomerated iron oxide feeds (col. 3, lines 1-2). The pretreated lump/pellet feed is introduced into a moving bed reactor (col. 2, lines 48-51), which is understood to be the type of shaft-furnace of which Midrex™ and HYL™ are a part.

In the process of Villarreal-Trevino et al., the feed material is pretreated by heating feed solids with a non-reducing gas stream to a temperature in the range of 75 °C to 1100 °C (col. 3, lines 31-35), which overlaps the claimed range of about 200°C to about 500 °C (applicant's amended claim 1) as well as the range of about 200°C to 450 °C (applicant's amended claim 2). It has been well settled that where the applied prior art teaches a range of compositions or properties overlapping a claimed range, motivation to select a particular range or value within the range disclosed by the prior art would have been a modification obvious to one of ordinary skill in the art at the time the invention was made. See MPEP 2144.05. It would have been obvious to one skilled in the art to have selected the claimed preheating temperature ranges from those disclosed by Villarreal-Trevino et al., because Villarreal-Trevino et al. teach that the whole temperature range of 75 °C to 1100 °C is operable to the claimed preheating process.

Villarreal-Trevino et al. teach that the pretreated ore enters the reduction zone of the reactor at a temperature of over 700 °C (col. lines 36-38), which overlaps the claimed temperature of about 750 °C. It would have been obvious to one skilled in the art to have selected the claimed preheating temperature from those disclosed by Villarreal-Trevino et al because Villarreal-Trevino et al teach that the whole temperature range above 700°C is operable to the claimed preheating process.

Since Villarreal-Trevino et al. teach that the feed has already been heated to 700 °C prior to entering the furnace, the time required to reach the temperature of 700 °C in the furnace is instantaneous. Likewise, the distance the material must travel within the furnace to reach a temperature of 700 °C is zero, since it is already at this temperature prior to introduction. Instantaneously falls within the applicant's claimed range of "within the first 20 minutes of charging the feed material into the furnace" (applicant's claim 1). Likewise, zero distance falls within the applicants claimed distance of "while the feed material descends the first half meter in the furnace" (applicant's claim 8).

Villarreal-Trevino et al. teach that the purpose of the pre-treatment in non-reducing conditions is to strengthen the ore, thereby decreasing the formation of fines in the reduction reactor (abstract and col. 2, lines 13-16).

With respect to applicant's amended claim 3: Villarreal-Trevino et al. teach that preheating is accomplished in a feed storage bin (Figure 1 and col. 4, lines 22-24). Heat is transferred to the preheating chamber via a hot non-reducing gas stream with sufficient thermal energy to raise the temperature of the solids to as high as 1100 °C.

Art Unit: 1742

This hot non-reducing gas stream is provided by combustion of fuel and waste off-gases with air (Col 4, lines 25-32).

With respect to applicant's amended claim 4: Villarreal-Trevino et al. are not explicit as to the temperature of the gas as it enters the pre-treatment chamber, however it is understood that this chamber is heated with this non-reducing gas stream to temperatures of up to 1100 °C (col. 3, lines 32-36). It is therefore implicit in this reference that the gas temperature must exceed 500 °C if there is to be sufficient energy to heat the solids in the chamber.

With respect to applicant's original claim 5: Villarreal-Trevino et al. teach a process option (Figure 5), which includes a reformer (69) to produce the reducing gas (col. 4, lines 12-34). The reducing gas is fed to the furnace (30), then waste off-gases are removed from and cooled in a heat exchanger (44), then either returned to the reformer, treated in another manner, or combusted as part of the fuel for the pretreatment system (Figure 5). The applicant's use of the phrase "associated with" is interpreted to mean anywhere in the system as opposed to directly connected to.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Villarreal-Trevino et al. in view of Beggs et, al., US patent 3,764,123.

Villarreal-Trevino et al. disclose an apparatus for preheating feed material to a direct reduction shaft furnace, see figure 5 below.

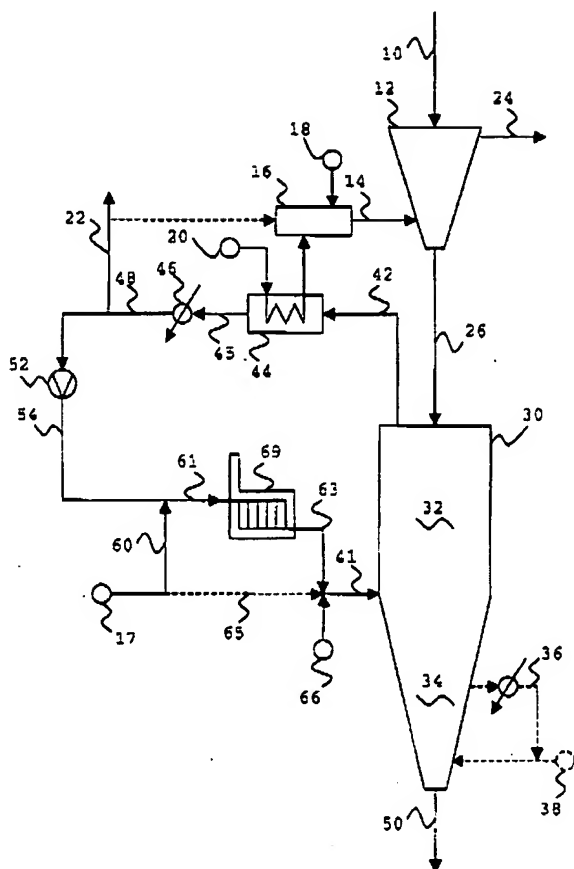


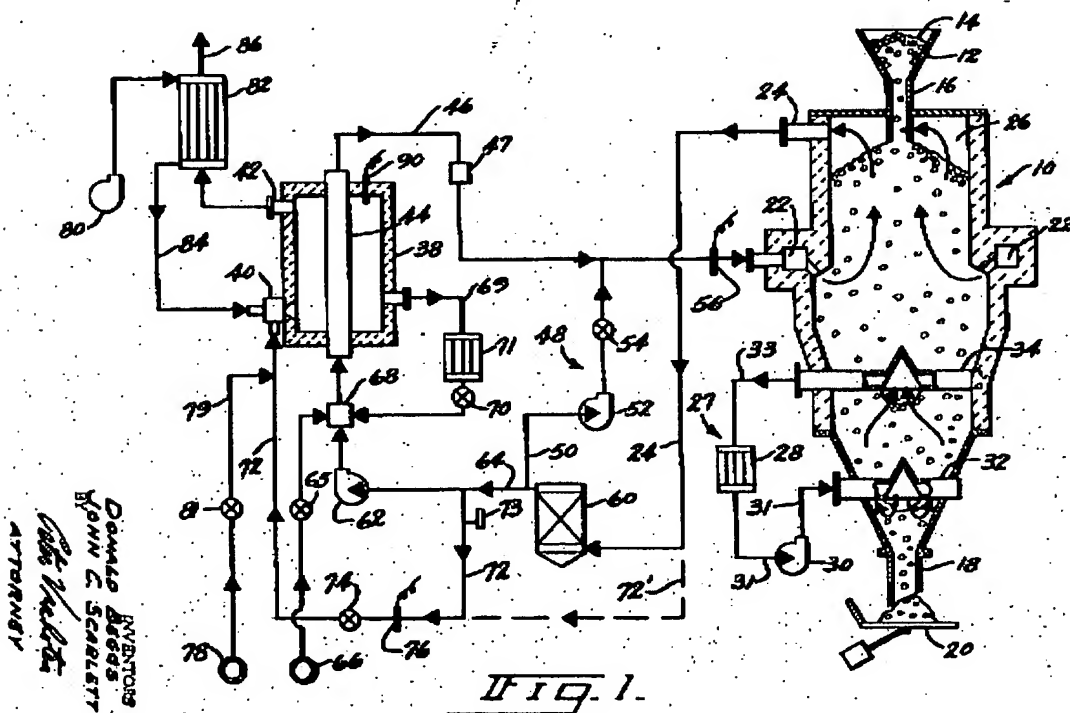
Figure 5

Villarreal-Trevino et al. disclose a moving bed reactor (col.2 lines 48-51) which is equivalent to a "shaft furnace" having an "upper feeding and heating portion" (12), a "middle gas feeding and reducing portion" (32), "and a lower product discharge portion" (34 and 50). Means is provided "for removing hot gas from the furnace" (42), and for "reforming removed off-gas" (69). A "feed material storage bin" (12) is provided, with means for "removing waste off-gas communicating with said storage bin for heating the contents thereof" (24) and "means of transporting the heated feed material to the

Art Unit: 1742

furnace and for charging the heated feed material into the shaft furnace for reduction" (26); the feed material storage bin is depicted as a hopper (12; col. 4, lines 23-24).

Villarreal-Trevino et al. do not specifically teach a means for heating the reformer by the combustion of gas, but this feature is conventional as evidenced by Beggs, et. al., Figure 1 below, which discloses a reformer (38) for reforming removed off-gas from a vertical shaft furnace, including a means for heating the reformer by combustion of gas (fuel fired burners, 40), and means for removing waste combusted off-gas from reformer (flue pipe, 42). Therefore, it would have been obvious ^{to} ~~for~~ one of ordinary skill in the art to incorporate the gas fired combustion heated reformer of Beggs et al. into the process of Villarreal-Trevino et al. ^{in order} ~~to~~ to produce a hot reducing gas with a controlled high reductant content relative to oxidant content as disclosed by Beggs et al.



Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Villarreal-Trevino et al. in view of Beggs et al., as applied to claim 6 above, and further in view of Becerra-Novoa et al, US patent 5,445,363.

Villarreal-Trevino et al. teach a shaft furnace according to applicant's claim 6, but do not specifically state that the feed storage bin is enclosed or that the means for transporting the heated feed material to the furnace is insulated. Since gas streams are injected into and collected from the feed storage bin (Figure 5, (14) gas inlet and (24) gas outlet), it is implicit that the bin is enclosed. Villarreal-Trevino et al does not disclose that piping 26 is insulated, but this feature is conventional as evidenced by Becerra-Novoa et al which discloses an apparatus for reducing ore comprising piping 38 which is insulated to conserve energy (col. 13, lines 55-60). It would have been obvious to one of ordinary skill in art at the time the invention was made to insulate the Villarreal-Trevino et al piping 26 in order to conserve energy as disclosed by Becerra-Novoa et al.

Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Art Unit: 1742

Claims 6 and 7 are provisionally rejected under 35 U.S.C. 101 as claiming the same apparatus as that of claim 7 and 8 of copending Application No.10/789,694. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Response to Arguments

Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 703 272 3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

Art Unit: 1742

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700